ARMORED VEHICLE, ESPECIALLY A COMBAT VEHICLE

The invention relates to an armored vehicle, especially a combat vehicle, having the features from the introductory portion of claim 1.

Gun carriage mountings are conventionally undertaken in frames that are welded into the vehicle housing of armored vehicles, and are subsequently mechanically finished with the overall vehicle housing for producing the tolerances that are required for the pivot bearing. This has been shown to be a drawback in that with modern armored vehicles, increasingly used for the housing structures are metal plates having thin wall thicknesses, and the ballistic protection is produced by auxiliary armoring. To minimize the manufacturing costs, it is attempted to dispense with the mechanical finishing of the finally welded vehicle housing, and to weld in tolerated components in a correctly mounted manner. On the other hand, the pivot bearings of gun carriages require very closely tolerated frames, the realization of the welding of which requires a considerable expenditure for equipment and production.

It is an object of the invention to embody an armored vehicle, especially a combat vehicle pursuant to the introductory portion of

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claim 1, in such a way that on the one hand closely tolerated installation conditions can be ensured for the pivot bearing, and on the other hand, the frame for receiving the gun carriage can be produced very economically and without the conventional mechanical finishing of the overall vehicle.

The realization of this object is effected pursuant to the invention by the features of the characterizing portion of claim 1. Advantageous further developments of the invention are described in the dependent claims.

The basic concept of the invention consists in the separation of the frame construction into a coarsely tolerated, non-mechanically finished outer part that is welded onto the housing structure, and a closely tolerated, mechanically finished inner part. In so doing, the positive connection of inner part and outer part can be carried out by means of a sealing process with a suitable sealing compound or filler, whereby the inner part can be brought into a correct mounting position via a simple device.

In the following, an embodiment of the invention is described in greater detail with the aid of the accompanying drawing. The drawings show:

Fig. 1 an isometric illustration of a combat vehicle that is otherwise not illustrated;

Fig. 1A a detailed portion from Fig. 1 taken along the line I -I

Fig. 2 an illustration analogous to Fig. 1 showing the roof plate of Fig. 1 with the outer part of the frame placed thereon;

Fig. 2A a detailed portion of Fig. 2 taken along the line II-II;

Fig. 3 an illustration analogous to Fig. 2 showing the roof plate with the outer portion of the frame and inserted interlocking elements;

Fig. 3A a detailed portion of Fig. 3 taken along the line III-III;

Fig. 4 an isometric illustration of the inner part for the outer part of Figs. 2 and 3 of the frame;

Fig. 4A a detailed portion of Fig. 4 taken along the line IV-IV;

Fig. 5 an enlarged partial cross-section taken along the line V-V in Fig. 5A showing the frame with the inner part inserted into the outer part;

Fig. 5A a reduced view onto the frame of Fig. 5;

Fig. 6 an enlarged partial section taken along the line VI-VI in Fig. 6A showing the frame of Fig. 5;

Fig. 6A a reduced view onto the frame of Fig. 6;

Fig. 7 an isometric illustration of the frame of Figs. 5 and 6.

Fig. 1 shows the roof plate 1 of a combat vehicle, the remainder of which is not illustrated; the roof plate is provided with an opening 1.1 that is to be surrounded by a frame for receiving the pivot bearing of a gun carriage. In the illustrated embodiment, the opening 1.1 has a polygonal configuration; however, a round opening can also be arranged at this location.

As explained in the following, the frame, which is to surround the opening 1.1, is built up of two components that are concentrically

disposed in one another and are secured to one another, namely a non-mechanically finished outer part 2 that has coarse tolerances and is connected by welding to the roof plate 1 of the vehicle housing, and a mechanically finished inner part 3 that has close tolerances and is positively connected with the outer part 2; the non-illustrated pivot bearing of the gun carriage is disposed on the inner part.

Fig. 2 initially illustrates the outer part 2 that is fixedly connected with the roof plate 1. It is constructed as a closed collar that is embodied as a bending construction or of abutting plates that are fixedly interconnected by welding. In the illustrated embodiment, the collar comprises collar plates 2.1 that are disposed perpendicular to the roof plate 1. However, the collar plates can also be disposed at an inclined arrangement to the roof plate. As can be seen in Fig. 1, the collar plates 2.1 are disposed in a polygonal manner. In principle, it would also be possible to construct a collar having a circular contour, although as will be described subsequently, the polygonal configuration of the collar has advantages with regard to manufacture, structure and protection. Inserted on the inner side of the collar that is constructed from the collar plates 2.1, at a prescribed distance from the roof plate 1, is a collar ring having a polygonal outer circumference that is adapted to the inner circumference of the collar; the collar ring is

composed of individual base plates 2.1 that are welded to one another, and is disposed in such a way that its upper side forms a plateau. The plateau can also comprise a single piece or can be composed of two halves.

The inner circumference of the collar ring that is composed of the base plates 2.2 has a circular configuration, and the collar ring is welded into the collar.

An inner part is now to be inserted into the outer part 2 and to be positively anchored there. In order to enable such a positive anchoring, interlocking elements 2.3 are inserted into the outer part 2, as can be seen in Figs. 3 and 3A. For this purpose, the collar that is composed of the collar plates 2.1 is provided in the corner regions of the abutting collar plates with slots that extend parallel to the roof plate and into which the interlocking elements 2.3 are inserted. In this connection, the polygonal shape of the collar has proven itself in that the interlocking elements 2.3 are supported in the slots due to the collar plates 2.1 that extend at an angle to one another. The interlocking elements 2.3 are inserted after the inner part 3 is inserted into the outer part 2. The inner part 3 illustrated in Fig. 4 has a cylindrical ring 3.1, the diameter of which is smaller than the smallest

diameter of the collar, and on the underside of which is welded on an annular bearing plate 3.2, while on the other side an annular plate 3.3 is welded on. In the illustrated embodiment, both the top plate 3.3 as well as the bearing plate 3.2 have a polygonal outer periphery and a circular inner periphery. The minimum outer diameter of the top plate corresponds at least to the minimum outer diameter of the collar, while the maximum outer diameter of the bearing plate 3.2 is smaller than the minimum inner diameter of the collar yet greater than the inner diameter of the collar ring composed of the base plates 2.2.

The inner part 3 is now introduced into the outer part 2, the interlocking elements are inserted into the slots in the corner regions of the collar plates 2.1, and the interior space of the frame, in the region between outer part 2 and inner part 3, is, after appropriate sealing by means of seals 6.1 and 6.2, filled with a filler 7. In this connection, one seal 6.1 is disposed at the upper annular gap between the top plate 3.3 and the upper edge of the collar plates 2.1, and the other seal 6.2 is disposed between the upper side of the collar ring, which is composed of the base plates 2.2, and the underside of the bearing plate 3.2. In so doing, the inner part 3 is positively and fixedly anchored in the outer part 2, as can be seen in Figs. 5 and 6. In this connection, the top plate 3.3 projects beyond the upper side of the outer part 2. Prior to

introduction of the inner part 3 into the outer part 2, the inner part 3 can be machined or finished to have the close tolerances that are required for receiving the pivot bearing.

Special protection modules, as armor protection, can be disposed on the frame that is produced in this manner, as can be seen in Figs. 5 and 6. In the illustrated embodiment, such protection modules are rectangular plates 4 that are disposed on the outside of the collar plates 2.1 of the outer part 2. Here also the polygonal configuration of the collar is advantageous since the protection modules can be embodied as planar and squared-off plates.

When the collar plates 2.1 are disposed in a perpendicular manner, it is expedient, in order to protect against radar detection, to cover the frame in the installed state by a hood or shroud, as illustrated in Figs. 5-7. The outer shape of the hood or shroud 5, which is placed upon the frame from above, is adapted to the polygonal periphery of the collar, whereby however the outer walls of the shroud 5 that are disposed opposite the collar plates 2.1 extend at an inclined arrangement to the roof plate 1. With regard to the selection of material and its shape, the shroud 5 is optimized relative to radar signature, and ventilation slots can be provided between the shroud 5

and the roof plate 1, as well as in the upper portion of the shroud, as can be seen in Figs. 5 and 6.